NELSON

Open & Parallel Tasks in Number

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September 2009

Let's Try This

- Some people say 10 is a special number.
- Why do you think 10 might be special?
- Think of a few reasons, if you can.

Last Time

- When we met last year, we talked about:

  - teaching through big ideas

  - differentiating instruction

This Time

- We will focus more on **open and parallel questions** as a way to engage students in important math, while manageably differentiating instruction.
- The intent is to go one step beyond rich problems to providing more choice than simply a choice of strategy.

Open tasks

- The question that asked you why 10 is special is an example of an open task.
- Virtually any student can engage, but it has a lot of mathematical potential.

More samples

- Show the number 12 as many ways as you can.
- Compare your solutions to someone else's.
- Find a solution that is a lot like yours, but not quite the same.

For example….

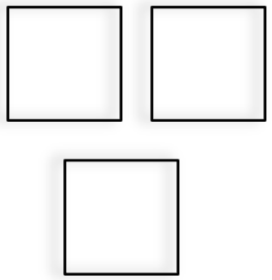
- The first two ways of showing 12 are very similar. So are the second two ways. Why is that?

x	x	x	x	x
x	x	x	x	x

x	x			

For example….

- Why are these alike?



X	X	X	X
X	X	X	X
X	X	X	X

Or....

- Be even more open by letting students choose their own number (not necessarily 12).
- Then they find different representations they created that they think are more alike than other representations.

More samples

- Tell about a time you would use the number ½.

More samples

- Choose a number for the second mark on the number line. Then place a dot on the line and tell what number you should use for that dot and why.

More samples

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- How is this open?

More samples

- Make up an addition sentence where the numbers 4, 2 and 8 appear somewhere in the sentence.
- Sample answers:
- 4 + 2 + 2 = 8
- 4 + 8 = 12
- 48 + 28 = 76

More samples

- Choose two numbers greater than 100 to compare. Tell which is greater and how you know.

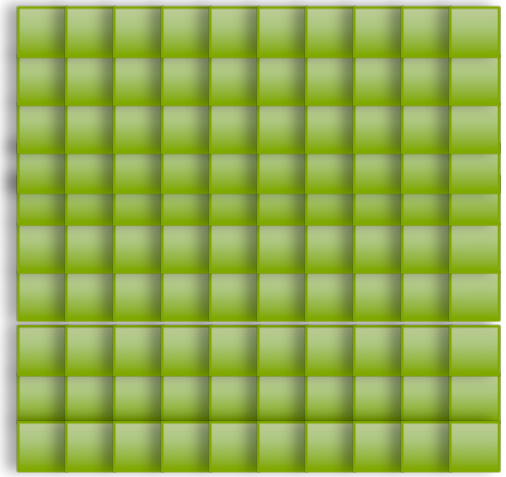
More samples

- Imagine using exactly 16 base ten blocks to represent a number.
- What might your number be?

1

10

100



More samples

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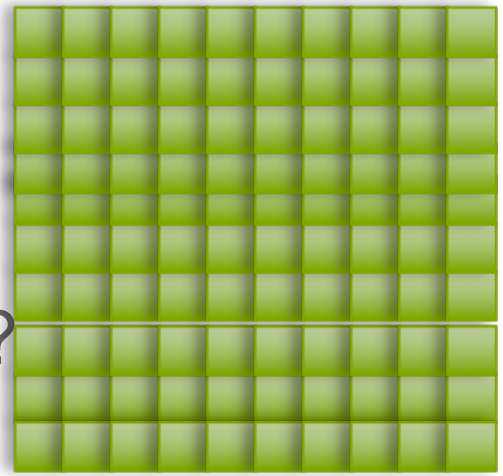


- How could this be more open?

More samples

- Select three different 2-digit numbers.
- Multiply each one by a different 1-digit number.
- Which multiplication was easiest for you to do? Why?

More samples

- You divide two numbers. The quotient is 23. What numbers might you have divided?
- You divide two numbers. The remainder is 3. What numbers might you have divided? Are there numbers you could not have divided by?

More samples

- How are 6.001 and 1.006 alike?
- How are they different?

Strategies to open up questions

- Provide the answer and ask for the question.
- For example, the quotient of (or the answer to) two numbers is 13. What could the numbers be?

Strategies to open up questions

- Ask for similarities and differences.
- For example, how is multiplying two numbers like adding them. How is it different?

Strategies to open up questions

- "Cover up" a number or more.
- For example, instead of asking students to calculate 328 + 415, ask them to choose digits for the blanks and then add: 39[] + 4[]8.

You try

- Choose one of these “closed” questions to open up (or create your own open question).

You try

- There were 13 bikes. 6 children rode away. How many bikes are left?
- How many $100 bills would it take to pay for a piano that costs $9000?
- Write two equivalent fractions to describe the blue section:

Parallel Tasks

- Two very similar tasks are provided.
- They deal with the same big idea, but the content might be at a developmentally different level.
- Students choose the task to complete.
- The discussion involves the entire class.

For example…

- What coins can you use to show 32¢?
- List as many answers as you can.

- What coins can you use to show 12¢?
- List as many answers as you can.

Common questions

- Did you have to use pennies? Why?
- What is the most number of coins you could use? Why?
- What is the most valuable coin you could use? Why?

Common questions

- Which combination did you start with? Why?
- How do you know you didn't miss a possibility?

For example…

- Choose a number that might tell how many students are in a class.
- Tell why that number makes sense.

- Choose a number that might tell how many students are in a large school
- Tell why that number makes sense.

Common questions

- What is the least number that makes sense to you? Why?
- What is the greatest number that makes sense to you? Why?

Common questions

- How could you convince someone that your number makes sense?
- Would the number change depending on where you live?

For example…

- A number is estimated as 10, but it's not 10.
- What is the most it might be?
- What is the least it might be?

- A number is estimated as 125, but it's not 125.
- What is the most it might be?
- What is the least it might be?

Common questions

- Would 100 be a reasonable estimate for your number? Why or why not?
- Would 5 be a reasonable estimate for your number? Why or why not?
- What number did you choose?

Common questions

- Why does your number make sense?
- How far should a number be from its estimate?

For example…

- Choose a 3-digit number and a 1-digit not 0 or 1.
- Multiply them, but make sure the product does not include the digit 4.
- Tell how you solved the problem.

- Choose two 1-digit numbers, not 0 or 1.
- Multiply them, but make sure the product does not include the digit 4.
- Tell how you solved the problem.

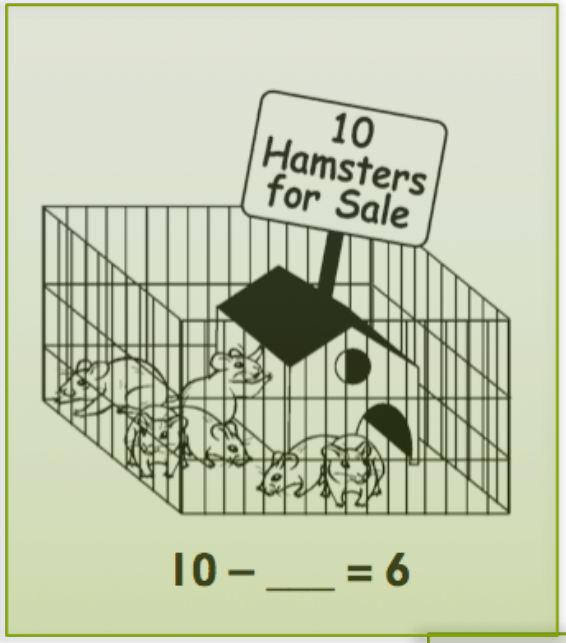
Common questions

- How do you know your two numbers work?
- What number combinations did you avoid when you chose your two numbers? Why?
- Could the numbers both be even? Both odd? One of each?

You try…

- Choose one of the tasks on the following page.
- Try to create a parallel task that might serve students either ahead or behind.
- Create a few common questions.

You try



Sarah and her 3 friends shared $20 equally.
Rey and his 2 friends shared $18 equally.
Which group would you choose to be in?
Explain your answer.

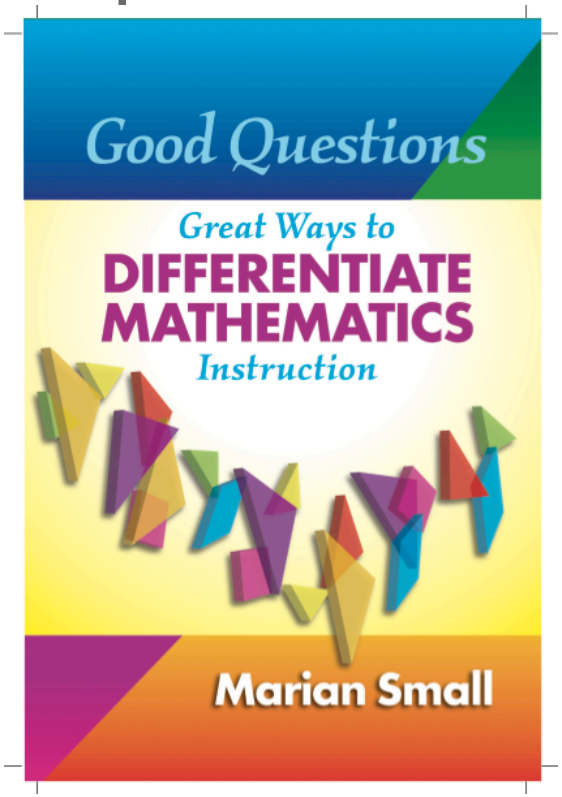
What five-digit numbers can you create using the digits 3, 3, 5, 5, and 0? Which is the greatest?

In Summary

- Using open and parallel tasks is a way to maintain a classroom community, while truly differentiating instruction.

More examples

- You can find lots more examples in the book shown here.



More examples

- You can find out how students differ developmentally using PRIME.

PRIME
PROFESSIONAL RESOURCES AND INSTRUCTION FOR MATHEMATICS EDUCATORS